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Impacts of Agricultural Research and Development:
"Why has impacts assessment research not made more of a difference?"

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Professional error, critical awareness and good science[1]

Robert Chambers

Abstract

The history of development is well provided with examples of beliefs which, though sincerely held by professionals in the social and natural sciences, have later come to be seen as ill-founded or wrong. Nine examples help to explain the tendency for questionable and erroneous beliefs and policies to be robustly resilient. Interactions of power, interests and mindsets, and of behaviour and experiences, play a part in generating and maintaining myth and error. Critical epistemological awareness to offset and correct misleading influences of professional, institutional and personal interests and orientations is proposed for a more prominent role in good science and policy, and for enhancing the impact of impact evaluations. Questions for self-critical reflection are proposed. The reader is invited to improve on these.

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[1] The usual disclaimers about responsibility being mine apply. This draft has been completed during travel without access to all the sources. It is work in progress. I shall be grateful to anyone able and willing to contribute suggestions for improvement, criticisms and/or corrections. My address is Institute of Development Studies, University of Sussex, Brighton BN1 9RE, UK. Tel (44) 1273 606 261. Fax (44) 1273 621202 . Email r.chambers@ids.ac.uk

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Prologue

A theme of this paper is that we – social and natural scientists – should be transparent and self-critically reflective about our orientations and predispositions. To be consistent, I have to start with myself so that the reader can see where I am coming from. I like to pose as a natural scientist in origin, but that was only in secondary school, followed by undergraduate history and then post-graduate public administration. In the practical and academic worlds I have survived largely in the gaps between disciplines. As in this paper, I am interested in connections between ideas, values, methods, behaviours and what we perceive and believe. Looking for gaps, errors and omissions in "normal" professional beliefs and practices, and suggesting how to correct them, has contributed to a reasonably sustainable livelihood. However, I am conditioned and predisposed to select cases for analysis which fit and exploit this interstitial niche. This means that I am vulnerable to exaggerating the weaknesses of mainstream science and to undervaluing its achievements. I try to balance somewhere between the negative academic and the positive practitioner. I believe that our knowledge of the world is partial and provisional, much of it formed interactively through personal and institutional interactions, interests and predispositions. I try to embrace an eclectic pluralism informed by doubt and self-doubt, distrusting fundamentalisms whether religious, political, positivist, green or alternative. I have often been wrong, and am likely to be wrong again, including in some of what follows.

This is not a normal way to start a paper. The question is whether it is a distraction, or whether it, or something like it, can help readers to come to their own judgements about the assertions and views which follow.. I invite and welcome critical feedback.

Rationale, Purpose and Method

The rationale for this paper is the history we have of debate, error and distortion in the relationships between science, beliefs, policy and action. In some areas of development concerned with agriculture, natural resources and the environment, these debates, errors and distortions have been marked. To be sure, there have been many successes. But the

number, scale and importance of areas of debate and of apparent error are so big that finding ways to diminish them would seem to deserve widespread attention. Learning and changing as a result of impact evaluations is one way. The question is what other courses of action, on their own or as part of impact evaluation processes, can contribute.

The purpose here is to look for ways to do better, expecting these to be through many actions in different domains, with successive approximations to fit ever-transient realities, rather than through scales-from-the-eyes or revolutionary transformations.

The method is selective empiricism. I take cases I know of, or which are accessible in the literature, where received wisdom has been challenged and qualified. My predisposition to find the challenges credible needs to be born in mind. The reader is referred especially to the sources as an aid to making judgements. From these cases I draw lessons about some ways error originates and is sustained, and how it may be avoided and reduced.

The examples we are concerned with are paradigmatic in the sense that they concern patterns of ideas, beliefs, values, methods and behaviours which are mutually supporting. Not all of them imply binary either-or polarisation, or what psychologists call "slot-rattling" (as when a Marxist becomes a Catholic, or when a CIA agent becomes an international terrorist). Rather many of them are less dramatic, with small changes and reconfigurations modifying views and actions. Indeed, the very polarisation of positions inherent in some of the classic paradigm shifts generates and sustains defensiveness and denial which are barriers to the small steps that often cumulatively lead to better policy and practice. As Norman Uphoff (1992) has argued, both-and thinking often gets closer to reality and is more constructive than either-or thinking.

Nine Cases

Examples are numerous. Their wide variety spans the Integrated Rural Development Projects of the 1970s, beliefs about human calorie requirements, understandings of the nature and causes of famines, the scale of post-harvest losses of grain, and the feasibility of multi-purpose animal-drawn wheeled toolcarriers (for analysis and sources for these see Chambers 1997: 17-32). And readers will be able to add others.

For illustration, and to provide additional material, nine cases can be outlined. These are of myths, misperceptions, denials and errors concerning field realities, policies and practices. Succinct summary oversimplifies and is vulnerable to precisely the unsubtle soundbites which I criticise later, and some of the detail may be open to debate, but the purpose is to provide an overview of context for later analysis and illustration.

1. *The Green Revolution turning red*

In the late 1960s and early 1970s it was quite commonly supposed by political scientists and social anthropologists that the green revolution was accentuating division and conflict (see e.g. Wharton 1969; Frankel 1971; Byres 1972; Mencher 1974 and for

critiques Harriss 1977 and Chambers 1984). Larger farmers were seen to be benefitting to the detriment of smaller farmers and farm labourers. This was leading to class polarisation and violence. "The green revolution turning red" became a catchphrase representing this set of beliefs.

The green revolution did not turn red. As the new seeds and practices spread, smaller farmers with access to irrigation came to benefit more (Hazell and Ramasamy; Farmer 1977). Class polarisation and violence did not emerge as major impacts. Patterns varied but agricultural wages generally rose.

2. *The Green Revolution and CDR farming*

In the early stages of the green revolution in India, a belief was prevalent among scientists that its yield and production benefits could be spread widely through combinations of conditions and actions, especially infrastructure and services (see e.g. Mosher 19). The Intensive Agricultural District Programme (IADP) was designed to achieve this through agricultural extension, input supply and other measures in districts selected for their good infrastructure and irrigation. More generally, the top-down centre-outwards package and transfer-of-technology approach was seen as the way to transform agriculture.

Even in the IADP Districts, adoption and benefits were disappointing in the early stages (Brown 1971). Controllable conditions, especially irrigation, were critical. More widely, the transfer of the technology in the form of modernising packages did not fit well with the problems and opportunities of much small (CDR = complex, diverse and risk-prone) farming. There is a continuing debate, for example concerning the Sasakawa Global 2000 (SG 20000) transfer-of-technology programme promoted in Africa by Norman Borlaug, Jimmy Carter and others. The balance of opinion and practice has shifted towards more diversified approaches with farmer participatory research, baskets of choice and the transfer of principles as means towards sustainable agricultural development.

3. *Warabandi in India*

The Indian Eighth Five Year Plan set the target of 8 million hectares of canal irrigation to be brought under the Northwest Indian *warabandi* system of timed proportional distribution of water.

The *warabandi* system can work with the conjuncture of four conditions: clear land rights, low rainfall, field channels which lead to individual fields, and most critically, ungated outlets with a high full supply level in canals to assure a reasonably constant flow through the outlet. These conditions rarely if ever apply together outside Northwest India. The programme was a disastrous flop.[2]

4. *The Madagascar System of Rice Intensification (SRI)*

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[2] I have presented more detail supporting these bald assertions in Managing Canal Irrigation pp xx-xx

The Madagascar System of Rice Intensification (SRI), evolved by Father Henri de Laulanie, entails simultaneous radical changes in cultivation practices which are traditional world-wide for both farmers and scientists. The changes include veery early transplanting, minimising transplanting trauma, transplanting single seedlings not clumps, wide spacing, aeration of roots, and weeding with a roller. With these practices, plant architecture above and below ground is dramatically different, tillers proliferate, and yields rise sharply, usually by a half or more, sometimes doubling or trebling, and on occasion reaching over 20 tons/hectare, exceeding what scientists have believed to be the biological maximum potential.[3]

WARDA and IRRI have evidently[4] reacted slowly. Reportedly only the social anthropologist at IRRI is doing any research on SRI. It is, however, being adopted and spreading steadily not only in Madagascar, but also in Bangladesh, China, India, Indonesia, and Sri Lanka.

5. *The Fuelwood Crisis in Africa*

In the 1970s and 1980s it was believed that much of SubSaharan Africa faced a severe fuel crisis and that in many areas fuelwood would run out. Standard analysis using "woodfuel gap theory", subtracting projected consumption from projected production, led to scenarios which could be caricatured as, for instance, that the last tree in Tanzania would disappear in 1990.

The belief was successfully challenged (Leach and Mearns 1988). Demand had been overestimated and supply and substitutions underestimated. The pattern varies but in general the crisis has not happened, and in quite extensive areas woody biomass has become more plentiful. Examples are parts of Kenya such as Machakos District (Tiffen et al 1993) and Central Province where it has been rising by over 4 per cent per annum (Ambio source to be added).

6. *Desertification*

The mainstream desertification narrative flourished in the 1970s and 1980s. A standard statement was that each year 6 million hectares of land were being "irretrievably lost through various forms of desertification or destroyed to desert-like conditions" and 21 million hectares annually were being reduced to zero or even negative productivity (UNEP 1984 cited in Swift 1997: 81, and repeated in the Brundtland Report and elsewhere). The process was attributed largely or entirely to human activity. One recommendation for Africa was draconian controls and massive reafforestation.

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[3] See for example Uphoff and Combs, Uphoff et al, Stoop, Uphoff and Kassam in press. For further sources contact Norman Uphoff at Cornell NTU1@cornell.edu

[4] "Evidently" means that this is based on verbal communications which I have not verified, and which I hope will be confirmed, qualified or refuted at this conference

A counter-narrative has now gained wide acceptance. According to this, the variable most affecting primary productivity is not human use but rainfall. The counter-narrative "combines ideas of indigenous technical knowledge and customary institutions, including common property management rules; it points to recent studies showing the high productivity of extensive nomadic pastoralism, and the excellent adaptations farmers and herders in the drylands have made to the vagaries of dynamic, event-driven ecosystems" (Swift 1997: 90)

7. *The Forest-Savanna Mosaic in West Africa*

Through colonial times and until recently scientists and administrators in Guinea (and latterly also donors) believed that the forest islands in the forest-savanna transition zone were relics of a much more extensive forest. Human activity, including burning, had been responsible for turning forest into savanna.

Meticulous research drawing on many sources, including travellers' journals, oral histories, time series aerial photographs, and analysis of forest species composition and age, has demonstrated beyond any reasonable doubt that the reverse is true: that through cultivation, judicious burning, and planting and protecting trees, people seek to extend the forests around their settlements, and that this holds also in the same zone elsewhere in West Africa (Fairhead and Leach 1996, and subsequent publications).

8. *Population, soil erosion and fertility*

A Malthusian narrative has been and remains widely disseminated about population and the environment, especially in SubSaharan Africa but also with much small farming and pastoralism in other parts of the world. In this view, increased population leads to vicious circles of deforestation, cultivation of more marginal land, shorter fallows, loss of fertility, erosion, degradation, declining yields, overgrazing and a food gap.

Numerous local-level studies have challenged and qualified this view (see e.g. Tiffen et al 1993, Stocking 1996, Keeley and Scoones (forthcoming) for Africa; and Ives 1987, Carson 1992, Gill 1993 and Tamang 1993 for Nepal)[5]. Much local variation and many counter-examples have come to light where increased population has contributed to intensification and greater sustainability of agriculture (for example through terracing, agroforestry, agropastoralism, double-digging, fish farming, cover crops, horticulture, composting, manuring and other forms of nutrient management). The picture emerging is of a patchwork of diverse conditions where the least questionable universal generalisation may be that universal generalisations are likely to mislead.

9. *Ujamaa in Tanzania*

In the national programme of *ujamaa* in Tanzania the intention was to move towards an ideal of collective agriculture in every village. The programme had a high political

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[5] For a summary and discussion of the evidence see Whose Reality Counts? (Chambers 1997): 23-29

profile. For a time there was a common belief that it could and would achieve some success.

Many villages cultivated a small common plot to show to party officials and visitors. Perceptive research by political science students at the University of Dar es Salaam on vacation, edited by Proctor and published with the ironic but diplomatic title Building Ujamaa in Tanzania revealed, in contrast, a reality that was unpopular, with degrees of coercion, resistance and non-implementation. The programme was eventually abandoned.

Caveats

Before drawing on these cases, three caveats or disclaimers are in order.

1. If we accept all knowledge as contingent and provisional, this applies also to the "corrected" versions of the myths or errors. There is unlikely to be any final or simple truth.
2. I have in part selected the cases to illustrate points I already had in mind.
3. The interpretations which follow are "work-in-progress" and in no sense final conclusions. I am hoping that critical comment, corrections and suggestions at this conference will lead to a later and better-grounded analysis.

The Genesis and Maintenance of Myth and Error

The genesis and maintenance of myth and error will be analysed at two levels: a general level of power, interests and mindsets; and a more particular level of behaviours and experiences.

1. *Power, interests and mindsets*

Power refers especially power to reward, recognise or dismiss and penalise. It has manifestations which are interpersonal, institutional and professional. In their seminal book Lie of the Land, Leach and Mearns conclude that it is "hierarchical relations of power between various participating actors, which, lead to convergences of commitments that coalesce in certain dominant directions" that account for " the remarkable continuity in received wisdom about environmental change in Africa" (1997: 28). A case has been made that "all power deceives"[6].

Interests refers to personal and institutional motivations, benefits and disbenefits. These include patronage and funding from foundations, governments, international agencies or the private sector; institutional survival and growth; personal income, prestige, recognition and international travel; and creative and moral satisfactions from good work and changing things for the better. Obvious examples of institutional interests can be found with multinationals dealing in fertilisers, pesticides and GM crops. Combinations of interests can be especially potent. With desertification, for example, as Swift (1997:

[6] See chapter 5 in Whose Reality Counts? which has this title

86-89) has persuasively argued, national governments in Africa, international aid bureaucracies, and some bilateral donors and some groups of scientists, all had common interests in promoting the narrative. With the Madagascar System of Rice Intensification it is easy to interpret and understand the slow response of CG Centres when they are professionally and institutionally committed to other approaches and lack the resources for rapid changes of programme and priority.

Mindsets is used to cover personal and professional orientations, ideologies and predispositions, including ways of seeing and interpreting things. They are conditioned by professional training, for example through textbooks, lectures and examinations in colleges and universities, through methods and the behaviours and findings which derive from them, through professional norms and the policies of journal editors, and more generally through current beliefs, fashions and ideologies. Neo-Marxist ideology and frames of analysis were in vogue among radicals at the time when the political scientists and social anthropologists who were looking for evidence of the green revolution turning red. Modernism and a belief in the top-down transfer of technology were widely accepted at the time of the green revolution, together with a belief that non-adopters of innovations were irrational laggards. African socialism and a desire to build on traditional African values of sharing and community predisposed Nyerere and other leaders and thinkers to advocate and promote *ujamaa vijijini*. In Swift's interpretation, national governments in Africa in the 1970s were seeking "to rescue an ideology, already failing at that time, of authoritarian intervention in rural land use: "desertification" was the crisis scenario they used to claim rights to stewardship over resources previously outside their control" (Swift 1997: 86). In these cases ideologies and mindsets, often combined with interests, can be seen to have predisposed observers or policy-makers to promote the ideas, interpretations and policies which were subsequently found to be misguided.

2. ***Combinations of Behaviours and Experiences***

The array of behaviours and experiences which can sustain and reinforce myths and errors, and rejections of alternatives, is impressive. Combined they can be quite formidable.

Ignorance. With hindsight it can be seen that those who thought that green revolution packages could be widely adopted did not appreciate the realities and rationality of CDR farming practices. Those who thought that *warabandi* could spread to irrigation outside the Northwest of India did not know the four preconditions for its operation, or that they hardly ever prevailed in other parts of India. Those who calculated the fuelwood gaps in Africa did not take into account that much fuelwood comes from clearing land for agriculture, that shrubs, bushes, twigs and leaves provide fuel, that when fuelwood grows scarce people economise and substitute other fuels, and that much fuel is dead not living wood. Those who promoted *ujamaa* in Tanzania did not appreciate the strength of the family as the unit for which people will work and make sacrifices or the strength of resistance to central interference in family and community life.

Overlooking history. Ignorance of history is a widespread factor. The past is easily and often overlooked by outside observers, researchers and visitors. This was true of "the green revolution turning red". As John Harriss pointed out (1977: 35), the much-cited Kilvenmanai incident in Thanjavur in 1968, in which 43 Harijans were massacred, was not a new phenomenon: such incidents had been described by a social anthropologist, Kathleen Gough, twenty years earlier. Leach and Mearns (1996), in their critique of received wisdom about the environment in Africa, stressed "the exclusion of historical data from much ecological science" as a weakness. And a variety of forms of historical evidence and insight were crucial in leading Fairhead and Leach (1996), and their colleagues, to overturn the deforestation myth of the forest-savanna transition zone in West Africa.

Selective visits, presentations and perceptions.

The biases of "rural development tourism" are not a new discovery. The visitor is taken to a special place which has had special treatment, and is treated to special presentations by people who have been specially trained and briefed and who have often done it often before[7]. The story line in each case is well rehearsed and guides have embedded it like a catechism, sometimes through almost daily repetition. The role call of special projects visited around the world is lengthy: in India three stand out – Sukhomajri, Mohini, and Ralegaon Sindhi, all of which have received quite extraordinary attention. A key moment in the history of SG 2000 in Ethiopia is widely recognised to have been a field visit in September 1994 by Meles Zenawi, already in power and subsequently Prime Minister, together with Norman Borlaug and Jimmy Carter (Keeley and Scoones forthcoming chapter 4). It is hardly likely that they were taken to a farmer who was failing. An Ethiopian informant (who did not wish to be named) told me that one farmer visited had a magnificent crop which had received three times the recommended dose of fertiliser. With strong political support from the top, the Ethiopian Government subsequently scaled up S-G 2000 to a national campaign with a plan for 1999 of reaching 4 million farmers (Howard et al 1998 cited in Keeley and Scoones chapter 4). Or in Tanzania, Mbioni, the contemporary journal of Kivukoni College in Dar es Salaam, published accounts of *ujamaa* based on repeated visits to three exceptional communities – Upper Kitete, Mbambara and the Ruvuma Development Association (RDA). These were probably almost the only instances of successful collective agriculture, and all three were idiosyncratically non-replicable: Upper Kitete was on a land frontier with economies of scale with wheat and cattle, and a capable and committed manager; Mbambara was a sisal estate taken over by it workers when its owner abandoned it; and the RDA, in a very poor and isolated area, was unique for its two charismatic and ideologically committed leaders and its communalism (Mbioni, various issues). Of all the thousands of supposed *ujamaa* villages in Tanzania he might have visited, Julius Nyerere twice went to the RDA. Not surprisingly it was some years before the failure of the *ujamaa* was recognised and it was abandoned.

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[7] One indicator is to ask a presenter how many times s/he has done it before. What "it" is may itself have changed. A Nepali Forester has told me that on approaching a village [probably near Kathmandu] a man came out to meet him with a piece of paper and at once began drawing a map. "Have you done this before?" "Oh at least a hundred times" (pers. comm. Yam Malla)

Extrapolating from local to regional and global

Simple narratives and statistics are often derived by scaling up from local research.

Good research scientists hedge their findings with caveats and qualifications. They can then be horrified when they find figures taken out of context, generalised for regions or even the globe, and repeatedly quoted to justify policies and programmes. Keeley and Scoones[8] (in draft, chapter 3) point out that aggregated Africa-wide nutrient balance figures have been based on extrapolations from a limited amount of work carried out in small areas in a few African countries. They quote "a recent and widely-circulated Bulletin of the American Soil Science Society on soil fertility" which cites "Smaling's seminal work" to indicate that an average of 660 kg N per year, 75 kg P ha per year, and 450 kg K per year during the last 30 years has been lost from about 200 million ha of cultivated land in 37 African countries (Sanchez et al 1997:4). Yet Smaling et al (1997: 50-52) comment on their work that "The studies were often done at the mini-plot level, the results of which cannot be linearly scaled up to the watershed" (let alone, one might add, to 200 million ha in 37 countries). One soil scientist said of a research study "When we wrote it we added umpteen footnotes and qualifications which seemed to get lost as the figures were taken up."

A second example is the short ecological reconnaissance carried out by Hugh Lamprey in about three weeks in 1975 in the north-western Sudan. His comparison of conditions with an earlier ecological survey was used by others to extrapolate that for the whole southern fringe of the Sahara there was a 6 km per annum southward movement of desert. A later study found that " There was a severe drought impact on crop yield during the Sahelian drought 1965-74 in the Sudan followed by significant recovery as soon as the rains returned" (Hellden 1991: 379, cited in Swift 1997: 84).

Repeating narratives, stories and statistics.

Simple, striking and memorable narratives, stories and statistics become powerful and persuasive through repetition.

Dominant narratives are reviewed by Keeley and Scoones (forthcoming). An example is the neo-Malthusian vicious circle of population increase, environmental degradation and a growing food gap. Narratives tend to embody simple relationships, occluding local complexities, qualifications and exceptions. The linearity of sentences constrains expression and thought to simple cause-effect relationships which are then generalised. Unlike diagrams, words do not readily permit the presentation of multiple causality or local diversity. Concepts and relationships are then simplified and streamlined in ways which fail adequately to represent realities.

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[8] In this paragraph and elsewhere I am grateful to James Keeley and Ian Scoones for ideas and for sharing with me chapters from their draft book on understanding environmental policy processes in Africa.

For their part, stories have been identified as a powerful way of changing organisations and their cultures (Denning 2000). They can also reinforce beliefs. "Good" stories, whether true, representative or not, get repeated and spread on their own. Much of the "evidence" that the green revolution was turning red was the single Kilvenmanai incident (cited, for example, in Frankel 1971: 115-6; and Wharton 1969). Much was made of this. But as John Harriss (1977: 35) observed "The Kilvenmanai incident…has been made the basis for optimistic predictions about the likelihood of "the green revolution turning red" by a kind of "rapportage overkill" which has used one incident many times over as evidence of the imminence of revolution".

The same is true of certain statistics which are simple, memorable, remembered and repeated. That post-harvest grain losses at the village level were 30 or 40 percent was striking and shocking when the figure was propagated. Although much careful field-level research showed these estimates to be grossly inaccurate and misleading (Greeley 1987), and in part derived from a time-of-harvesting trial at IRRI (de Padua 1976), they were widely repeated at conferences and workshops and led to major misallocations of resources. That desertification was spreading at the rate of 6 million hectares a year was easy to remember and quote, and became embedded in the environmental discourse through its use by UNEP and the Brundtland Commission. The same was true of the figure of 6 million hectares of land in India said to be waterlogged from irrigation, a figure which statistical archaeology found to be spurious (Chambers 1988).

Repeating narratives, stories and statistics embeds them like rote learning. Catechists and teachers are well aware of the importance of repetition for internalising knowledge and beliefs. Repeated often enough they become simplified, losing their qualifications, and are then embedded and believed. This may occur especially among those who speak in public about their subjects, and do this in a mode of advocacy. How profound a disability public repetition can be is barely recognised, despite its many pathological manifestations among politicians of whatever persuasion[9].

Public relations, soundbites and speeches

Myths are also established and reinforced through public relations activities. Annual reports, videos to introduce visitors to institutions, and activities of public relations firms all contribute. Professionally, the latter are concerned to please their clients by propagating whatever their message may be and establishing whatever image they wish. They also seek to minimise criticism. An SG 2000 meeting was convened in London,

[9] I have been horrified to catch myself out. In PRA-related workshops I have for several years been recounting an example of participatory mapping, reported by Jules Pretty, in an Indian village. I have been saying that four separate groups came up with populations of 312, 312, 316 and 321. 316 was found to have double-counted a household of 4, but 321 had included an outcast household of 9 on the edge of the village. I was deeply shocked to find that the actual figures (Chambers 1997: 145) were 239, 239, 242 and 247. On some occasion I may have said "the figures were something like…." but then later repeated them without the qualification. Also the extra people were three not four, and not in one household but divided between three households, and the extra family had five members not nine. The point is that I really believed 312,312,316 and 321 and the story I was telling. One wonders how many more serious examples could be found.

and organised by a public relations consultant. Ambassadors and High Commissioners from African countries were invited. The programme was organised with only 15 minutes for questions and discussion, from 1300 – 1315, with lunch pending[10].

Soundbites, too, have their part to play. The green revolution turning red, the desert on the move, the food gap widening – these are phrases that catch on. Speechwriters play a part here. They need catchy and simple messages. They know what needs to be said, for whatever political or institutional reasons. And as asserted above, those who then speak the messages internalise and remember them.

Dealing with unwelcome information

Information can be unwelcome which threatens policies, institutions, funding, research programmes, or personal or institutional reputations or prestige. Such discordant, threatening or "unhelpful" information can be dealt with in several ways, among them rejection, denial, confidentiality, or ignoring, shelving, or postponing consideration.

Rejection and denial allow scope for progress through debate. Secrecy though can be very damaging. Hugh Lamprey's influential 1975 report on desertification "remained unpublished – indeed was treated as confidential- for at least a decade after it was written, but its conclusions were widely cited" (Swift 1996: 78). One is reminded of the refusal of access to the skull of Piltdown man as a result of which it took long for it to be revealed as a hoax. Lamprey's report was not a hoax, but it seems likely that had access to it been open, the weakness of the desertification narrative would have been easier to appreciate.

Ignoring, shelving and postponing are best illustrated from my own less than impeccable behaviour. When responsible for coordinating evaluation for the Kenya Special Rural Development Programme in 1969-71 I believed gravity reticulation water projects were a very good thing. A sociologist (Padfield) wrote a think-piece which raised perceptive cautions and criticisms. I feared that these would threaten the substantive programme. I remember that after glancing at the paper I did not even want to read what he had written, let alone pass it on to others, and again and again postponed properly considering and discussing it.

For obvious reasons, such behaviour usually goes unacknowledged. Findings or ideas which are discordant, unwelcome or potentially damaging pose threats that may be personal or institutional or both. It is especially difficult for people or institutions with heavy commitments of funding and high profile programmes (SG 2000's package programmes, India's *warabandi*, IRRI's research to produce a "golden rice", and Tanzania's programme of *ujamaa* come to mind) to accept other good or better approaches, even if they are complementary rather than competitive. Those concerned deserve understanding and sympathy, given their personal and institutional investments, if they find it difficult to admit error or change course. To do so may be made more

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[10] This was so inadequate for any serious discussion that I and at least one other who had received invitations decided not to participate.

difficult when the alternatives, as is usual, are less clearcut, more diverse, and harder to "sell". Nevertheless, the costs of such behaviour can be high indeed.

Concluding

Alone, any one of these tendencies might not be too difficult to overcome. Combined they can take off into strongly self-sustaining myth. When power, interests, mindsets, behaviours and experiences variously combine in support, myths and errors can be difficult to dispel and correct. The biases towards repeating and remembering simple narratives compounds the problems. In Swift's (1997: 85) words "A simple idea, adorned with powerful slogans, proves remarkably hard to change, even when shown to be patently inaccurate".

A final illustration can come from Starkey's (1988) scholarly and sobering study of multi-purpose wheeled toolcarriers. These received considerable publicity, not least from ICRISAT where there was a considerable investment of professional time and resources. Worldwide, Starkey found that over 45 designs had been made, but that of the 10,000 or so toolcarriers produced the number ever used by farmers was negligible. When he corresponded with those who were developing and testing toolcarriers a common reply was that they were facing difficulties but they knew they had been successful elsewhere. None of these appreciated the extent to which they were deceived. All were victims of a collective fantasy.

The lesson from all these examples is the importance of ground truth. The huge challenge is for policy and commitment to accommodate and reflect the diversity, complexity and dynamism of the real world. And as is increasingly accepted, much ground truth is best learnt by enabling local people themselves to express, analyse and share their realities and priorities.

Lessons for the Impact of Impact Evaluation

The impact of impact evaluation depends on the significance of findings. It also depends on credibility and the nature of the receiving environment.

Lessons for the impact of impact evaluation can be described at three levels.

The first is professional and methodological. Participatory methods and approaches have been through a phase of explosive innovation, not least in PM and E (Participatory Monitoring and Evaluation) (see e.g. Estrella et al 2000). They have been widely regarded as limited to qualitative research. There is now, however, much evidence and many examples of participatory approaches and methods generating numbers, and an argument that they are a means to the "best of both worlds", combining the advantages of both qualitative and quantitative work and findings (Chambers 2002).

A question here is whether impact evaluation studies are vulnerable to being unduly conservative. We can ask whether there is here a Kuhnian (Kuhn 1962) paradigmatic

tension between normal science and a new approach. It is understandable that established methods are used in impact evaluation for the sake of credibility. It can be asked, though, whether the methods are not recognised, accepted and adopted for reasons similar to the lack of interest in the Madagascar SRI. There is an argument for working on the trade-offs between conventional credibility (for example through questionnaire surveys, with their many shortcomings) and other methods which promise greater accuracy and insight but are less accepted.

The second level is the institutional receiving environment and interests. The impact of impact evaluation depends not only on the credibility of the research, the mode of presentation and the extent to which is can be reduced to simple messages with implications for policy and action, but also on the politics, interests and interactions of actors and institutions.

The third level is personal, in terms of mindsets, ideologies, predispositions, experiences and behaviours. To what extent findings are received, understood, internalised and acted upon may depend critically on a few influential individuals and what they accept and do.

Lessons for Good Science

The question here is where one draws the boundaries of "good science". They can be drawn narrowly around normal methodology and norms for the presentation of results. Perhaps few would wish nowadays to be so narrow. If social responsibility, policy influence and poverty impact are included, then good science has to involve critical reflection on the issues explored above. What has been called "self-critical epistemological awareness", reflecting on what we see, how we think, how we learn and unlearn, what we believe, and what motivates and conditions what we perceive, select, stress and represent, can be argued to be a vital, if neglected, element in good science.

How much self-critical epistemological awareness is there in the CG system? How much is it rewarded or penalised? How could it be penalised less and rewarded more?

Self-critical Reflection: a Code of Questions?

Natural and social scientists reading so far may be inclined to exclude themselves from these errors. My question then would be whether myths and errors are not part of the human condition. Activities covered by the strict codes of rigour of accepted scientific method constitute a fairly well defined zone amenable to protection. But so much of practice related to science, as in the examples in this paper, lies outside that zone. Just as there are rules for good scientific experimentation, we can ask whether there should also be rules, a code, for the messier and more error prone zones outside the laboratory and off the research station. Many such have been proposed, not least for field visits and interactions with farmers (going back to Robert Rhoades' (1982) classic The Art of the Informal Agricultural Survey) and now including participatory research with and by farmers. The literature that I can recall, though, pays little or no attention to the dimension of self-critical epistemological reflection.

Each of us might have our own list of questions that we could ask ourselves, quite frequently, in the course of work and decisions. Here are some, for discussion and improvement:

- What do my disciplinary training, research commitments and career and institutional interests predispose me to look for, see, select, accept, believe and disseminate?
- What am I conversely predisposed to overlook, not notice, reject, and disbelieve?
- What facts, views or simplified ideas have I internalised through selective experiences, and internalised, simplified and stripped of qualifications through unchallenged repetition?
- Am I disabled by power from being able to learn?
- What would be threatened if I were to change my view?
- What alternative or more nuanced views are there, and who holds them?
- Can I argue their case against mine?
- When I do, does my original view change?

If those involved in the cases cited had seriously asked themselves these questions, would or could some of the errors and misguided policies have been avoided?

In sum, is self-critical epistemological awareness an essential part of good evaluation and of good science?

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